ISSN: 2148-4724
E-ISSN: 2548-0030

TMSJ

TURKISH MEDICAL STUDENT JOURNAL

Volume: 4 Issue: 3 Oct 2017

http://tmsj.trakya.edu.tr/

TMSJ

TURKISH MEDICAL STUDENT JOURNAL

THE OFFICIAL JOURNAL OF
TRAKYA UNIVERSITY FACULTY OF MEDICINE

Citation Abbreviation: Turkish Med. Stud. J.

VOLUME 4 - ISSUE 3 - OCT 2017

Published three times a year

Free access to the Journal's web site: *http://tmsj.trakya.edu.tr*

Manuscript Submission*: tmsj@trakya.edu.tr*

Editorial Office
Address: Trakya Universitesi Tıp Fakültesi 22030 Edirne, Turkey
Phone: +90 (284) 235-7653
E-mail: dekanlik@trakya.edu.tr

Printing at: Trakya Üniversitesi Basımevi
Edirne Teknik Bilimler M.Y.O Sarayiçi Yerleşkesi, 22020 Yeni İmaret, Edirne, Turkey
Phone: +90 (284) 224 02 83
Printing Date: October 2017
ISSN: 2148-4724 E-ISSN: 2548-0030

TMSJ
TURKISH MEDICAL STUDENT JOURNAL

Indexed In
Türk Medline
Science World Index
Science Library Index
Academic Keys

Publisher
Trakya University

TMSJ
TURKISH MEDICAL STUDENT JOURNAL

Owner
Prof. Ahmet Muzaffer DEMİR, MD
Dean, Trakya University Faculty of Medicine

Responsible Manager
Aslı Nur ÖZKAN
Trakya University Faculty of Medicine, Edirne, Turkey

AIMS & SCOPE

Turkish Medical Student Journal is the first scientific, peer reviewed, open access journal in Turkey to be run by medical students and to publish works of medical students only. In that respect, Turkish Medical Student Journal encourages and enables all students of medicine to conduct research and to publish their valuable research in all branches of medicine.The journal is the official scientific publication of the Trakya University Faculty of Medicine, Edirne, Turkey and is published three times a year, in February, June and October. The language of the journal is English.

Turkish Medical Student Journal publishes researches, interesting case reports and reviews regarding all fields of medicine. The primary aim of the journal is to publish original articles with high scientific and ethical quality and serve as a good example of medical publications for those who plan to build a carreer in medicine. Turkish Medical Student Journal believes that quality of publication will contribute to the progress of medical sciences as well as encourage medical students to think critically and share their hypotheses and research results internationally.

The Editorial Board of the Turkish Medical Student Journal and the Publisher adheres to the principles of International Council of Medical Journal Editors (ICMJE), Committee on Publication Ethics (COPE) and US National Library of Medicine (NLM).

Turkish Medical Student Journal is indexed in Google Scholar, Science World Index, Science Library Index and Academic Keys. Turkish Medical Student Journal is available as hard copy. In addition, all articles can be downloaded in PDF format from our website (http://tmsj.trakya.edu.tr), free of charge.

EDITORIAL PROCESS

All manuscripts submitted for publication are reviewed for their originality, methodology, importance, quality, ethical nature and suitability for the journal by the editorial board and briefly revised by the advisory board whose members are respected academicians in their fields. Turkish Medical Student Journal uses a well-constructed scheme for the evaluation process. All manuscripts are reviewed by two different members of the editorial board, followed by peer revision from at least two members, belonging to different institutions, of our peer review committee. Turkish Medical Student Journal editors assist authors to improve the quality of their papers. The editor-in-chief has full authority over the editorial and scientific content of Turkish Medical Student Journal and the timing of publication of the content.

ETHICS

Turkish Medical Student Journal is committed to the highest standards of research and publication ethics. Turkish Medical Student Journal does not allow any form of plagiarism, as the editorial board adheres the principles of Committee on Publication Ethics (COPE). All recieved manuscripts are screened by a plagiarism software (iThenticate). Similarity percentage more than 25 and six consecutive words cited from an another published paper in the same order are the causes of immediate rejection. All orginal articles have to be approved by an ethical committee, moreover informed consent should be obtainted from patiens involving case reports.

MATERIAL DISCLAIMER

All opinions and reports within the articles that are published in the Turkish Medical Student Journal are the personal opinions of the authors. The Editors, the publisher and the owner of the Turkish Medical Student Journal do not accept any responsibility for these articles.

INSTRUCTIONS TO AUTHORS

CATEGORIES OF ARTICLES

The Journal publishes the following types of articles:

Original Research Articles: Original prospective or retrospective studies of basic or clinical investigations in areas relevant to medicine.

Content:
- Abstract (average 400 words; the structured abstract contain the following sections: aims, methods, results, conclusion)
- Introduction
- Material and Methods
- Results
- Discussion
- References

Review Articles: The authors may be invited to write or may submit a review article. Reviews including the latest medical literature may be prepared on all medical topics.

Content:
- Abstract (average 400 words; without structural divisions)
- Titles on related topics
- References

Case Reports: Brief descriptions of a previously undocumented disease process, a unique unreported manifestation or treatment of a known disease process, or unique unreported complications of treatment regimens. They should include an adequate number of photos and figures.

Content:
- Abstract (average 200 words; the structured abstract contain the following sections: introduction, case report, conclusion)
- Introduction
- Case presentation
- Discussion
- References

Editorial Commentary/Discussion: Evaluation of the original research article is done by the specialists of the field (except the authors of the research article) and it is published at the end of the related article.

Letters to the Editor: These are the letters that include different views, experiments and questions of the readers about the manuscripts that were published in this journal in the recent year and should be no more than 500 words.

Content:
- There's no title and abstract.
- The number of references should not exceed 5.
- Submitted letters should include a note indicating the attribution to an article (with the number and date) and the name, affiliation and address of the author(s) at the end.
- The answer to the letter is given by the editor or the author(s) of the manuscript and is published in the journal.

Scientific Letter: Presentations of the current cardiovascular topics with comments on published articles in related fields.

Content:
- Abstract (average 200 words; without structural division)
- Titles on related topics
- References

What is Your Diagnosis? : These articles are related with diseases that are seen rarely and
show differences in diagnosis and treatment, and they are prepared as questions-answers.

Content:
- Titles related with subject
- References

MANUSCRIPT PREPARATION

Authors are encouraged to follow the following principles before submitting their material.

-The article should be written in IBM compatible computers with Microsoft Word.

ABBREVIATIONS: All abbreviations in the text must be defined the first time they are used, and the abbreviations should be displayed in parentheses after the definition. Authors should avoid abbreviations in the title, abstract and at the beginning of the first sentences of the paragraphs.

FIGURES, PICTURES, TABLES AND GRAPHICS:

-All figures and tables should be cited at the end of the relevant sentence. Explanations must be placed at the bottom of figures, whereas at the top of tables.

-Figures and tables must be added to the e-mail as attachments in .jpg or .tiff formats.

- The name of the file should be named as: last name of the first author_Table/Figure_No.TIFF/JPEG. For example: Sancar_Figure_1.JPEG.
- All abbreviations used, must be listed in explanation which will be placed at the bottom of each figures and tables.
- For figures and tables to be reproduced relevant permissions need to be provided. This permission must be mentioned in the explanation.
- Pictures/photographs must be in color, clear and with appropriate contrast to separate details.

TITLE PAGE: A concise, informative title, should be provided. All authors should be listed with academic

degrees, affiliations, addresses, office and mobile telephone and fax numbers, and e-mail and postal addresses. If the study was presented in a congress, the author(s) should identify the date/place of the congress of the study presented.

ABSTRACT: The abstracts should be prepared in accordance with the instructions in the "Categories of Articles" and placed in the article file.

KEYWORDS:

-They should be minimally three.

- Keywords should be appropriate to "Medical Subject Headings (MESH)"

(Look: www.nlm.nih.gov/mesh/MBrowser.html).

ACKNOWLEDGEMENTS: Conflict of interest, financial support, grants, and all other editorial (statistical analysis, language editing) and/or technical assistance if present, must be presented at the end of the text.

REFERENCES: References should be numbered in the order they are cited. Only published data or manuscripts accepted for publication and recent data should be included. Inaccessible data sources and those not indexed in any database should be omitted. Titles of journals should be abbreviated in accordance with Index Medicus- NLM Style (Patrias K. Citing medicine: the NLM style guide for authors, editors, and publishers [Internet]. 2nd ed. Wendling DL, technical editor. Bethesda (MD): National Library of Medicine (US); 2007 - [updated 2011 Sep 15; cited Year Month Day] (http://www.nlm.nih.gov/citingmedicine). All authors should be listed if an article has three or less authors; first three authors are listed and the rest is represented by "ve ark." in Turkish articles and by "et al." in English articles. Reference format and punctuation should be as in the following examples.

Journal: Muller C, Buttner HJ, Peterson J et al. A randomized comparison of clopidogrel and aspirin versus ticlopidine and aspirin after placement of coronary artery stents. Circulation 2000;101:590-3.

Book Section: Sherry S. Detection of thrombi. In: Strauss HE, Pitt B, James AE, editors. Cardiovascular Medicine. St Louis: Mosby; 1974.p.273-85.

Books with Single Author: Cohn PF. Silent myocardial ischemia and infarction. 3rd ed. New York: Marcel Dekker; 1993.

Editor(s) as author: Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

Conference Proceedings: Bengisson S. Sothemin BG. Enforcement of data protection, privacy and security in medical informatics. In: Lun KC, Degoulet P, Piemme TE, Rienhoff O, editors. MEDINFO 92. Proceedings of the 7th World Congress on Medical Informatics; 1992 Sept 6-10; Geneva, Switzerland. Amsterdam: North-Holland; 1992.p.1561-5.

Scientific or Technical Report: Smith P. Golladay K. Payment for durable medical equipment billed during skilled nursing facility stays. Final report. Dallas (TX) Dept. of Health and Human Services (US). Office of Evaluation and Inspections: 1994 Oct. Report No: HHSIGOE 169200860.

Thesis: Kaplan SI. Post-hospital home health care: the elderly access and utilization (dissertation). St. Louis (MO): Washington Univ. 1995.

Manuscripts accepted for publication, not published yet: Leshner AI. Molecular mechanisms of cocaine addiction. N Engl J Med In press 1997.

Epub ahead of print Articles: Aksu HU, Ertürk M, Gül M et al. Successful treatment of a patient with pulmonary embolism and biatrial thrombus. Anadolu Kardiyol Derg 2012 Dec 26. doi: 10.5152/ akd.2013.062. [Epub ahead of print]

Manuscripts published in electronic format: Morse SS. Factors in the emergence of infectious diseases. Emerg Infect Dis (serial online) l995 Jan-Mar (cited 1996 June 5): 1(1): (24 screens). Available from: URL:http://www.cdc.gov/ncidodlElD/cid.htm

EDITORIAL

Dear readers,

We are proud to present our latest issue, prepared with great efforts of a great team, to you precious readers. Turkish Medical Student Journal, which retains its feature of being a dynamic journal which renews itself by following the developments occurring in the medical world since its establishment, also includes many original works in this issue.

For me this issue is particularly meaningful beside its academic importance. This is the last issue that I have officially worked for in Turkish Medical Student Journal, which we have established with baby steps back in the day when we have barely had a grasp on the terms such as an article and a journal. There are so many people to thank. First of all, I would like to thank the founding team we have put together with all the difficulties. I would also like to express my gratitude for our advisory board, who always stand by our side and improve our editing skills with a master and apprentice relationship. This journal, which has given me many friends, memories and experiences, will always remain as one of the unforgettable firsts for me.

Every valedictory is a new beginning. I congratulate our valuable editor, Koray Demirci, to whom I will pass on the torch. There is not even a slightest doubt that Koray and his team will become successful.

I am finally coming to an end. I conclude the editorial with thanks to the unique team that I have, with whom there were times we laughed together, and there were times we made each other upset. Duties we assume are temporary. It is a great team like them, which stays permanent.

Stay with science.

Aslı Nur ÖZKAN
Editor-in-Chief

CONTENTS

Turkish Med. Stud. J. 2017; 4: 38-40 DOI: 10.4274/tmsj.2017.04.03.0001
Received: 13.09.2017 - Accepted: 17.09.2017

PREOPERATIVE LIPID PROFILE OF PATIENTS OPERATED FOR CORONARY BYPASS SURGERY

Furkan Yiğitbilek[1], Mahmut Alper Güldağ[1], Fatih Erkan Akay[1], İdil Memiş[1], Volkan Yüksel[2]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Cardiovascular Surgery, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: Dyslipidemia is a major risk factor for atherosclerosis and coronary heart disease. Evidence showed that an atherogenic lipid pattern is characterized by high levels of small, dense low-density lipoprotein, low levels of high-density lipoprotein cholesterol, elevated triglyceride and total cholesterol levels; similar with the lipid profiles of diabetics.

Methods: In this study, 91 patients who underwent coronary artery bypass grafting in Trakya University Hospital Department of Cardiovascular Surgery from April 2017 to September 2017 were analyzed retrospectively. As for statistical analysis, Student's t-test and Mann Whitney U tests were performed.

Results: The lipid profiles of patients were not significantly related to their ages and genders. However, when diabetic patients' lipid profiles were analyzed, their low-density lipoprotein, and total cholesterol values were found to be significantly lower.

Conclusion: It is unexpected to see that patients with diabetes had significantly lower total cholesterol and low-density lipoprotein levels than non-diabetic patients. As for the reason, it is thought that patients with diabetes are more conscious of their health condition.

Keywords: Coronary disease, atherosclerosis, diabetes mellitus

INTRODUCTION

Dyslipidemia is a major risk factor for atherosclerosis and coronary heart disease (1). Evidence showed that an atherogenic lipid pattern is characterized by high levels of small dense low-density lipoprotein (LDL), low levels of high-density lipoprotein cholesterol (HDL-C), elevated triglyceride and total cholesterol levels. High LDL, low HDL-C and high total cholesterol levels have been reported to increase cardiovascular disease (CVD) frequency in diabetic or non-diabetic patients (2, 3).

Coronary artery bypass grafting (CABG) is a very common surgical treatment for patients who have atherosclerosis in one or more coronary arteries (4). As a matter of fact, CABG is the gold standard for patients with diabetes.

The aim of this study is to investigate whether there is a correlation between lipid profile and having coronary bypass surgery in diabetic and non-diabetic patients.

MATERIAL AND METHODS

This study was approved by Scientific Researches Ethics Committee of Trakya University Medical Faculty. In this study, 91 patients who underwent CABG in Trakya University Hospital Department of Cardiovascular Surgery from April 2017 to September 2017 were analyzed retrospectively. Patients who are taking statins, underwent heart valve or an urgent surgery are not included in the study. There was no data concerning the diabetes status of 4 patients, triglyceride, HDL-C and total cholesterol levels of 3 patients and LDL levels of 2 patients.

Adress for Correspondence: Furkan Yiğitbilek, Trakya University School of Medicine, Edirne, TURKEY - e-mail: fyigitbilek@gmail.com

With the usage of the protocol numbers, the data about the patients' preoperative states were gathered from hospital's archive. Gathered information contains demographic data (gender, age) and lipid profiles (HDL-C, LDL, triglyceride, total cholesterol levels) also shows whether the patient is diagnosed with diabetes or not. Routine laboratory test of the patients was taken in concern, no further tests were performed. Normal levels are LDL: 0 - 100 (mg/dl), HDL-C: 40 - 60 (mg/dl), triglyceride: 0 - 150 (mg/dl), cholesterol: 0 - 200 (mg/ dl).

Afterwards, all of the data was analyzed by using SPSS version 22.0 (IBM corp., Armonk, NY, USA). Student's t-test and Mann-Whitney U test were performed to see whether there is a difference regarding patients' lipid profiles and demographic charecteristics between diabetic, non-diabetic; also gender groups. As for descriptive statistics; arithmetic mean ± standard deviation, number and percentages, median (minimum-maximum) were used. P value < 0.05 is considered statistically significant.

RESULTS

This retrospective study included 91 patients operated for CABG at Trakya University Faculty of Medicine, Department of Cardiovascular Surgery. The mean age of patients was 63.87 ± 9.33. 60 (65.9%) of the patients were male and 31 (34.1%) of them were female. Mean HDL-C value of the patients was 38.98 ± 8.03, mean LDL value was 113.75 ± 29.77, mean triglyceride value was 161.89 ± 114.71 and mean total cholesterol value was 176.10 ± 39.50.

Table 1: Lipid Profiles of Patients Prior to CABG Surgery

	Number of Patients (Percentage(%))
LDL	
High	62 (68%)
Normal	29 (32%)
HDL-C	
High	1 (1%)
Normal	39 (43%)
Low	51 (56%)
Total cholesterol	
High	21 (23%)
Normal	70 (77%)
Triglyceride	
High	40 (44%)
Normal	51 (56%)

It was detected that in 62 (68%) patients, LDL levels were high; in 21 (23%), total cholesterol levels were high, while triglyceride levels were higher in 40 (44%) patients, only one patient with high HDL-C was found, and in 51 (56%), low HDL-C levels were observed. Lipid profiles of the patients are given in Table 1.

There was no difference between gender groups regarding patients' ages and lipid profiles. However, when patients' lipid profiles were analyzed regarding the diagnosis of diabetes, diabetic patients showed statistically significantly lower levels of LDL and cholesterol(p=0.009, p=0.02 respectively).

DISCUSSION

Low-density lipoprotein is one of the most atherogenic class of cholesterol carrying lipoprotein in human plasma. LDL is modified by oxidation and taken up by macrophages in the intima of the arterials resulting in the formation of foam cells, which is an important step in atherogenesis.

The level of LDL in the plasma is regulated by the LDL receptors, which eliminates LDL from plasma by receptor-mediated endocytosis. The cholesterol content of the hepatocyte regulates the LDL receptors located primarily in the liver. If the gene that is encoding the LDL receptors is defected, LDL level in plasma is elevated and produces premature coronary atherosclerosis, which occurs in patients with familial hypercholesterolemia (5). Other factors like physical injury or stress as a result of direct trauma or hypertension, turbulent blood flow e.g. where arteries branch, hyperlipidemia and chronically elevated blood glucose can be a cause for atherogenesis.

Atherosclerosis is an important cause of vascular diseases worldwide. Its major clinical manifestation is CVD. When the worldwide meta-analysis researches are collected, lipid measures (specifically LDL cholesterol) are accepted as causal risk factors for atherosclerosis. However, high lipid profile may not cause CVD. It is considered that environmental and genetic factors are important in the development of CVD (6).

In our study, patients had low levels of total cholesterol (mean: 176.10 mg/dl), LDL (mean: 113.75 mg/dl), and HDL-C (mean: 38.98), but high triglyceride levels (mean: 161.89). Our patients' lipid profile were consistent with the findings of the review of Onat A, which analyzed the lipid profiles of 3687 Turkish people (7). In our study group, the lipid profiles were not as significant

as in a meta-analysis on Finn and Swedes according to difference of age, sex and diabetes status (8). In a study that has been conducted with over 300.000 people, the decrease of HDL and LDL levels has shown a better result in CVD risk if they are decreased together (9). In our study, low levels of HDL at 56% of the patients have not shown any hindrance to have a CABG surgery because 68% of the patients' LDL values were high.

It was not an expected result to see that patients with diabetes had significantly lower total cholesterol and LDL levels than non-diabetic patients. As for the reason, it is thought that patients with DM are more conscious of their health condition.

In conclusion, although high cholesterol levels have a prectipitating effect on atherosclerosis and CVD, diabetes does not have a significant impact on the lipid profile in this study group.

Ethics Committee Approval: This study was approved by Scientific Researches Committee of Trakya University School of Medicine.
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Castelli WP, Anderson K, Wilson PW et al. Lipids and risk of coronary heart disease. The Framingham Study. Ann Epidemiol 1992;2:23-8.

2. Zhang L, Qiao Q, Tuomilehto J et al. Blood lipid levels in relation to glucose status in European men and women without a prior history of diabetes: the DECODE study. Diabetes Res Clin Pract 2008;82:364–77.

3. Pankow JS, Kwan DK, Duncan BB et al. Cardiometabolic risk in impaired fasting glucose and impaired glucose tolerance: the atherosclerosis risk in communities study. Diabetes Care 2007;30:325–31.

4. Hirotani T, Kameda T, Kumamoto T et al. Coronary artery bypass grafting in patients with cerebrovascular disease. Ann Thorac Surg 2000;70:1571–6.

5. Sandhofer F. Physiology and pathophysiology of the metabolism of lipoproteins. Wien Med Wochenschr 1994;144(12-13):286-90.

6. Herrington W, Lacey B, Sherliker P et al. Epidemiology of atherosclerosis and the potential to reduce the global burden of atherothrombotic disease. Circulation Research 2016;118:535-46.

7. Onat A. Lipids, lipoproteins and apolipoproteins among Turks, and impact on coronary heart disease. Anadolu Kardiyol Derg 2004;4:236-45.

8. Zhang L, Qiao Q, Laatikainen T et al. The impact of dyslipidemia on incidence of coronary heart disease in Finns and Swedes with different categories of glucose tolerance. Diabetes Res Clin Pr 2011;91:406-12.

9. Emanuele Di A, Nadeem S, Philip P et al. The emerging risk factors collaboration. Major lipids, apolipoproteins, and risk of vascular disease: individual data analysis of 302,430 participants from 68 prospective studies. JAMA 2009;302:1993-2000.

TMSJ
Turkish Med. Stud. J. 2017; 4: 41-6 DOI: 10.4274/tmsj.2017.04.03.0002

Received: 01.09.2017 - Accepted: 07.09.2017

DIFFERENCES OF BEHAVIOUR IN MEDICAL AND NON-MEDICAL STUDENTS SUFFERING FROM MYOFASCIAL PAIN

Yasin Nalbantlar[1], Ahmet Emin[1], İlknur Uzunoğlu[1], Gözde Zeynep Demir[1], Seher Gevri Teker[1], Hülya Armutlugöynük[1], Hakan Tuna[2]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Physiotherapy and Rehabilitation, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: The aim of this study is to determine whether there is a difference in triggering factors of myofascial pain, the frequency, professional help seeking, the use of exercise, and the use of drugs between the students of the medical faculty and the other faculties.

Methods: This survey study was conducted among 200 voluntary Trakya University students; 100 of them were from the medical faculty and the other 100 were from the other faculties. All participants suffered from myofascial pain. "Standardized Nordic Questionnaires for The Analysis of Musculoskeletal Symptoms" has been used to prepare the questionnaires. Chi-Square test was used for statistical analysis.

Results: It was found that the most common trigger factor of myofascial pain is studying. In the medical faculties, the proportion was 62% and in the other faculties, it was 44%. The second most common factor was the usage of computers (medical faculty students (16%) other faculty students (27%)). Pain frequency was more than 5 times a week among medical school students it was 32% and 40% among the other faculty students. 34% of medical school students and 17% of other faculties' students were doing exercise to relieve myofascial pain. 18% of medical faculty students and 33% of other faculties' students were taking medication to relieve myofascial pain. 15% of medical faculty students and 18% of other faculties' students at least once consulted a doctor because of myofascial pain.

Conclusion: There was no significant difference found in terms of triggering factors and frequency of pain. However, usage of medication and participating in regular exercise were found to be significantly different between medical students and other faculties' students.

Keywords: Myofascial pain syndrome, neck pain, survey

INTRODUCTION

Myofascial pain syndrome (MAS) is a clinical syndrome of soft tissue pain caused by skeletal muscle. Myofascial pain is localized and typically characterized by referred pain that is continuous and repetitive from a trigger point in the skeletal muscle (1, 2).

The trigger point is small and hypersensitive. Referred pain typically gets worse and intensifies with stimulations such as pressure, needling, stretching, extreme heat and cold applied to the trigger point (3-6). There may be more than one trigger point associated with a single referred pain region (7). Although the mechanism of the referred pain is known, the underlying mechanism in myofascial pain syndrome is not completely understood (8, 9).

Four major criteria and four confirmatory observations can be mentioned in the diagnosis of MAS (10, 11). They are described as follows:

Major Criteria

1. Tension band palpation (if muscle can be reached)
2. Instant sensitivity in the tense band
3. Patient's pain indication on the sensitive nodule (determines the active trigger point)
4. Painful limitation of all passive range of motion

Adress for Correspondence: Yasin Nalbantlar, Trakya University School of Medicine, Edirne, TURKEY - e-mail: yasinnalbantlar@gmail.com

Confirmatory Observations

1. Visual or tactile determination of local twitch response
2. Observation of the local twitch response by needle immersion on the sensitive nodule
3. Sensitive nodular pain or increased sensation by pressing
4. Electromyographic demonstration of spontaneous electrical activity specific to the active locus in the sensitive nodule of the tense band

There is no important laboratory finding that contributes to diagnosis. Radiological examinations are recommended to reveal the causes and make differential diagnosis. MAS is the most common cause of musculoskeletal pain and its prevalence in the society is reported as 12-55% (12, 13).

MATERIAL AND METHODS

This study was approved by Scientific Researches Ethics Committee of Trakya University Medical Faculty. This descriptive, cross-sectional survey study was applied to 200 volunteers, including 100 medical faculty students and 100 other faculties' students of Trakya University. Among the participating volunteers, 100 were selected as female and 100 of them were male. The including criteria were having myofascial pain and being a student at Trakya University. The students who are using nonsteroidal anti-inflammatory drugs for myofascial pain were not included in the questionnaire.

We were inspired by The Standardized Nordic Questionnaires for the Analysis of Musculoskeletal Symptoms when preparing the questionnaire (14). Name, gender and program of study were among the obtained data as socio-demographic variables. The questionnaire consists of 6 questions including myofascial pain and the volunteer's attitude towards it. The activity triggering the pain, the frequency of pain, the severity of pain as well as the volunteer's consumption of painkillers, exercise habit and professional help seeking behaviour were compared between genders and university faculties. Studying, mobile phone usage, computer usage and hobbies were considered as parameters that trigger myofascial pain (15-17). The frequency of pain episodes in a week was noted. The Wong-Baker Faces Pain Rating Scale was used to describe the severity of the pain (18). Following questions were included:

1. Which activity caused your pain?
2. How often does your pain occur?
3. What is the severity of your pain? (1-10)
4. Have you consulted a specialist for your pain?
5. Do you use any painkillers for your pain?
6. Do you have a regular exercise for your pain?

The data were input into the software SPSS version 23 by IBM for statistical analysis. Chi-square test was performed for the comparison of categorical data between the groups. Statistical significance was set at p-value < 0.05.

RESULTS

According to the results of the survey, among the triggering factors of myofascial pain in all participants, studying was the common one with 53%. This rate was 62% for medical faculty students and 44% for other faculties' students (p=0.077) (Figure 1). This rate was found to be 64% for female students and 42% for male students (p=0.004) (Figure 2).

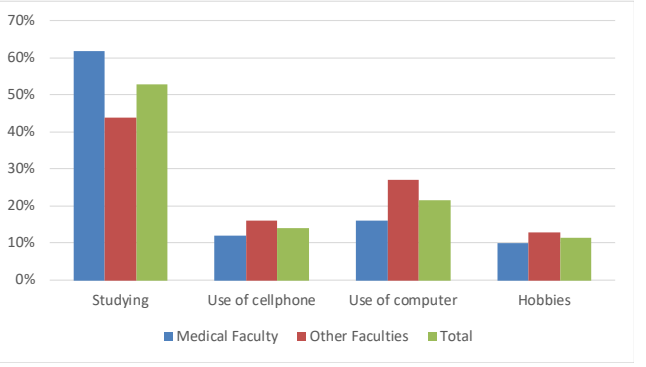

Figure 1: Comparison of triggering factors of myofascial pain among medical and non-medical students.

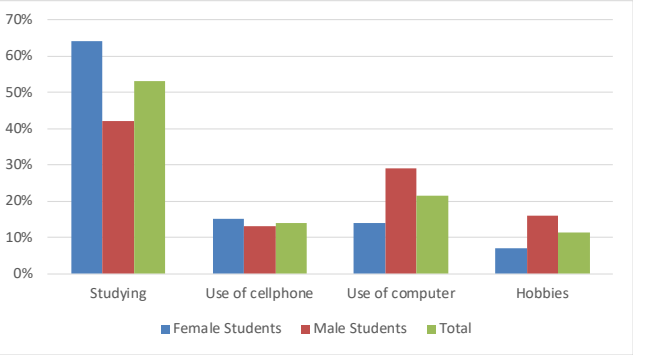

Figure 2: Comparison of triggering factors of myofascial pain among female and male students.

Thirty three percent of medical faculty students stated that they suffered from myofascial pain at least 5 days a week. This rate was determined as 40% for the non-medical students (p=0.355) (Figure 3). 41% of female students and 31% of male students stated that they had suffered from myofascial pain at least 5 days a week (p=0.234) (Figure 4).

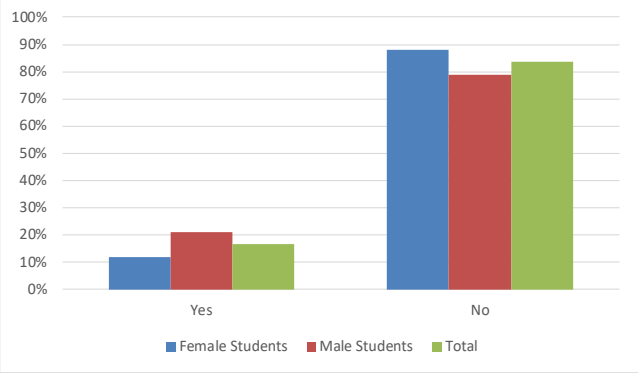

Figure 3: Percentage of myofascial pain sufferers among female and male students.

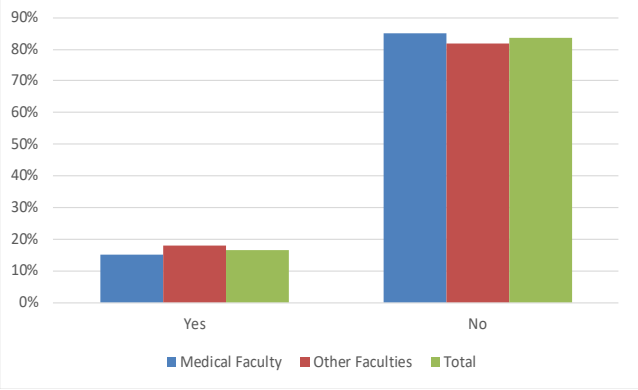

Figure 4: Percentage of myofascial pain sufferers among medical and non-medical students.

While 15% of medical students had consulted to a specialist for myofascial pain, 18% of other faculties' students had done so (p=0.568) (Figure 5). The rate of consulting to a specialist was found to be 12% for male students and 21% for female students (p=0.086) (Figure 6).

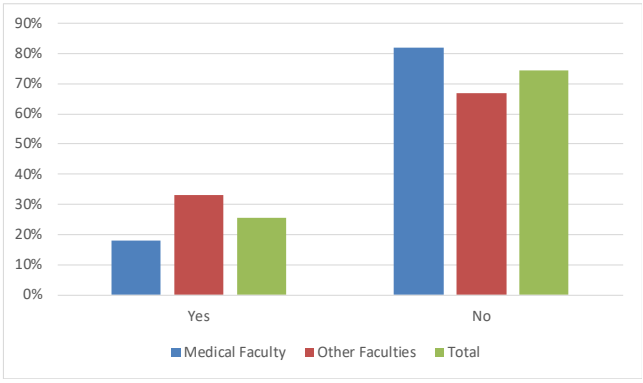

Figure 5: Percentage of medical and non-medical students who have consulted a specialist because of myofascial pain.

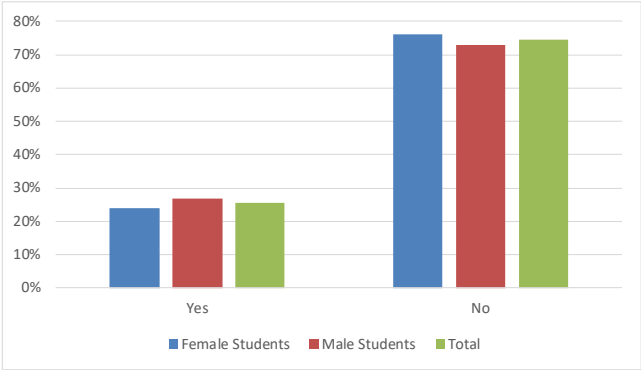

Figure 6: Percentage of female and male students who have consulted a specialist because of myofascial pain.

The usage of medication to relieve myofascial pain was 18% in medical faculty students and 33% in other faculties' students (p=0.015) (Figure 7). This rate was 24% for female students and 27% for male students (p=0.624) (Figure 8).

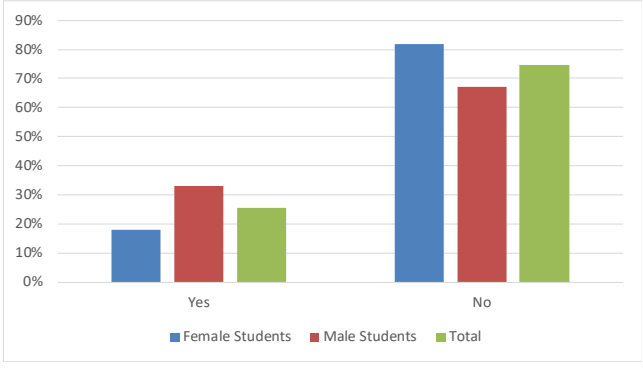

Figure 7: Percentage of male and female students who have used medication for myofascial pain.

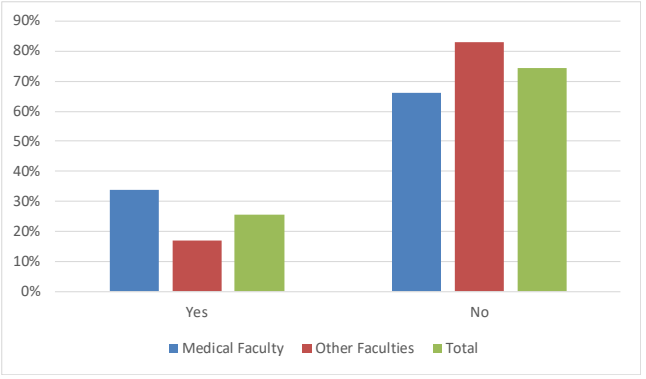

Figure 8: Percentage of medical and non-medical students who have used medication for myofascial pain.

The rate of those who exercise regularly to relieve myofascial pain was found to be 34% in medical faculty students and 17% in other faculties' students (p=0.006) (Figure 9). This rate was found to be 18% for female students and 33% for male students (p=0.015) (Figure 10).

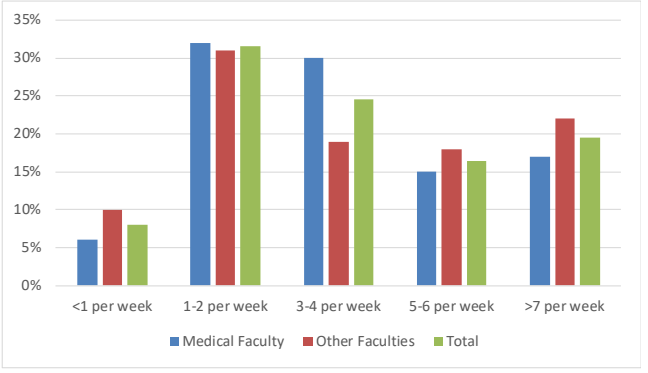

Figure 9: Regular exercise frequency among medical and non-medical students.

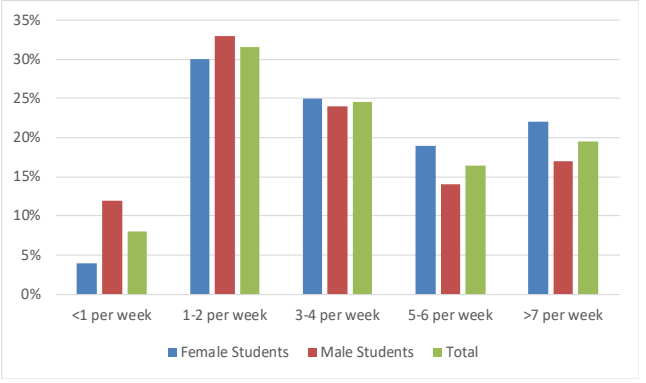

Figure 10: Regular exercise frequency among male and female students.

When the severity of myofascial pain was evaluated on a scale of 10, with "0" representing "no pain at all" and "10" representing "the worst imaginable pain, 34% of the medical faculty students and 41% of the other faculty students reported that their pain scale would be over 5 (Figure 11). 54% of the female students and 21% of the male students have defined their pain as 5 and above over 10 (Figure 12).

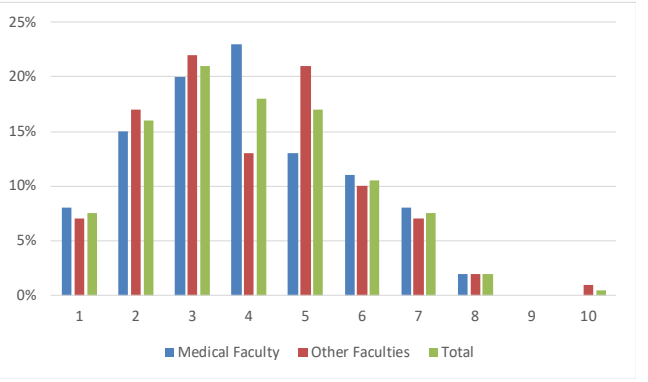

Figure 11: Distribution of myofascial pain severity scores in medical and non-medical students.

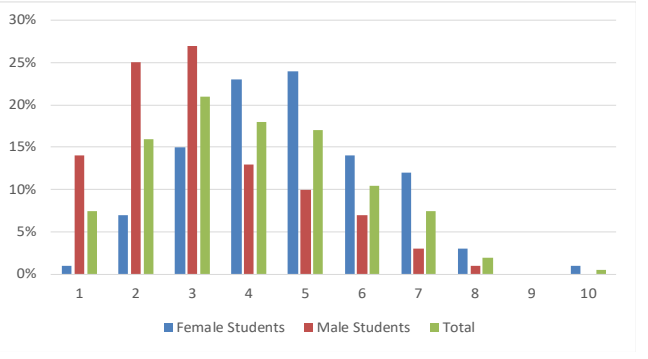

Figure 12: Distribution of pain severity scores in female and male students.

DISCUSSION

Posture and visual stress might be playing a role in the development of myofascial trigger points (19, 20). Hoyle et al. (19) reported that sitting and doing computer work contributes to the development of myofascial trigger points. Treaster et al. (20) also concluded that visual stress is involved in trigger point development, in their study on subjects doing computer work they reported that electromyographic recordings of trapezius muscle reveal that visual stress is related to trigger point development (20).

In our study, we aimed to target a similar condition by questioning postural triggers such as studying and computer usage. There was no significant difference between the students from medical faculty and the other faculties regarding the causes of myofascial pain (p=0.077). However, the fact that studying as a factor is more common in the medical faculty by virtue of the medical faculty being more intensive and the medical students having to prepare for residency admission tests. However, there was a significant difference between male and female students (p=0.004). In terms of pain triggering in female students, course work took the first place with 64%. In male students, computer usage is significant with 29%.

No significant difference was found in tendency to seek professional help between medical and non-medical students as well as the comparison of male and female (p=0.568, p=0.086 repectively). However, the low rate of professional help seeking was due to the fact that the students do not worry about their pain until the pain reaches high levels.

When the medical students were compared with the students from other faculties, a significant difference was found in terms of medication use (p=0.015). This is based on the fact that medical students are more aware about medication usage and they prefer to exercise instead of taking medications. No significant difference was found between students of both genders (p=0.624).

There was also a significant difference in doing regular exercise between the medical and non-medical students as well as between female and male students (p=0.006, p=0.015 respectively). We attribute this to the fact that medical faculty students are more aware and male students are more willing about the profits of doing exercise.

This study shows that posture has a role in myofascial trigger point development, and a population with a higher awareness of myofascial pain would prefer a non-drug treatment. Further studies are recommended to reveal the exact nature of myofascial trigger point development and the benefits of both medical and non-drug treatment options.

Ethics Committee Approval: This study was approved by Scientific Researches Committee of Trakya University School of Medicine.
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Simons DG. Myofascial pain syndrome of head, neck, and low back. In: Dubner R, Gebhart GF, Bond MR (editors): Pain Research and Clinical Management, Vol 3- Proceedings of the Fifth World Congress on Pain; 1988 Amsterdam, Elsevier Science Publishers.

2. Fricton JR, Auvinen MD, Dykstra D et al. Myofascial pain syndrome: electromyographic changes associated with local twitch response. Arch Phys Med Rehabil 1985;66:314-7.

3. Torebjork HE, Ochoa JL, Schady W. Referred pain from intraneural stimulation of muscle fascicles in the median nerve. Pain 1984;18:145-56.

4. Institute of medicine: anatomy and physiology of pain. In: Pain and Disability: Clinical, Behavioral and Public Policy Perspectives. Washington DC: National Academy Press;1987.p.130-1.

5. Reeves JL, Jaeger B, Graff-Radford SB. Reliability of the pressure algometer as a measure of myofascial trigger point sensitivity. Pain 1986;24:313-21.

6. Jaeger B, Reeves JL. Quantification of changes in myofascial trigger point sensitivity with the pressure algometer following passive stretch. Pain 1986;27:203-10.

7. Travell JG, Simons DG, Lois SS et al. Myofascial pain and dysfunction: the trigger point Manual. 2nd ed. Baltimore: Williams & Wilkins; 1983.

8. Kellgren JH. Preliminary account of referred pains arising from muscle. Br MedJ 1938;1:325-7.

9. Travell J, Rinzler SH. The myofascial genesis of pain. Postgrad Med 1952;11:425-34.

10. Bonica JJ. Management of myofascial pain syndromes in general practice. JAMA 1957;164:732-8.

11. Good MG. Objective diagnosis and curability of non-articular rheumatism. BrJ Phys Med 1951;14:1-7.

12. International Association for the Study of Pain Subcommittee on Taxonomy. In: Merskey H, Bogduk N editors. Classification of Chronic Pain, Descriptions of Chronic Pain Syndromes and Definitions of Pain Terms. Seattle: IASP Press; 1986.p.81-4.

13. Sola AE, Kuitert JH. Myofascial trigger point pain in the neck and shoulder girdle: Report of 100 cases treated by injection of normal saline. Northwest Med 1955;54:980-4.

14. Kuorinka I, Jonsson B, Kilbom A et al. Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms. Appl Ergon 1987;18:233-7.

15. Simons DG. Muscle pain syndromes-part I. Am J Phys Med 1975;54:289-311.

16. Simons DG. Muscle pain syndromes-part II. Am J Phys Med 1976;55:15-42.

17. Kellgren JH. Observations on referred pain arising from muscle. Clin Sci 1938;3:175-90.

18. Wong D, Whayley L. Wong –Baker Faces Pain Rating Scale.1986.

19. Hoyle JA, Marras WS, Sheedy JE et al. Effects of postural and visual stressors on myofascial trigger point development and motor unit rotation during computer work. J Electromyogr Kinesiol 2011;21:41-8.

20. Treaster D, Marras WS, Burr D et al. Myofascial trigger point development from visual and postural stressors during computer work. J Electromyogr Kinesiol 2006;16:115-24.

TMSJ
Turkish Med. Stud. J. 2017; 4: 47-9 DOI: 10.4274/tmsj.2017.04.03.0003
Received: 22.08.2017 - Accepted: 04.09.2017

F-18 FDG PET/CT FINDINGS IN DIFFERENTIATED PAPILLARY CARCINOMA OF THYROID AND DETERMINATION OF METABOLIC ACTIVITY

Mehmet Oğulcan Tezel[1], Oğuz Mercan[1], Öznur Yumurtacı[1], Cansu Kurt[1], Gülay Durmuş Altun[2]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Nuclear Medicine, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: In well differentiated thyroid cancers, FDG PET has a relatively low sensitivity. F-18 FDG PET/CT is an imaging method which is used before the treatment and in high risk patient groups with suspected recurrent disease. In this study we aim to determine the character of metabolic activity in differentiated thyroid cancer and in case of metastasis and to evaluate the findings of F-18-FDG PET/CT images in high risk patient group of differentiated thyroid cancer.

Methods: The data of 79 patients who underwent imaging for staging or restaging and followed at Trakya Univer¬sity Faculty of Medicine from 2010 to 2015, were included in this study. Patient reports were analyzed retrospectively. Age, gender, size of thyroid lesion, presence of lymphadenopathy, other organ metastases (lung, liver, brain, bone) were included in the study.

Results: The findings of 79 patients (29 male, 50 female) with papillary differentiated thyroid cancer were included in the analyses. The mean age of participants was 51±15 years. 14 patients (18%) were evaluated as normally. Recur¬rent disease was detected in the thyroid gland of 10 patients (13%) (SUVmax: 6.2±5.1; 2.3-19.3). In 54 patients (68%) lymph node metastasis was detected (SUVmax; 5.8±5.1; 2.1-24.2). 12 patients had liver metastasis (SUVmax: 5.7±3.9; 2.0-11.7), 12 patients had bone metastasis (SUVmax: 6.1±2.9; 2.2-13.9), 8 patients had lung metastasis (SUVmax: 4.3±4.5; 1.0-4.9) and one patient had brain metastasis (SUVmax: 10.2).

Conclusion: Papillary differentiated thyroid cancer is associated with a tumor showing low glucose affinity, but it is understood that the tumor changes its behavior and gets metabolically active in the patients within the high risk group and in those with systemic metastasis.

Keywords: Thyroid cancer, F-18 FDG, PET/CT

INTRODUCTION

Thyroid gland an important, butterfly-shaped endocrine gland located in front of the neck, under the throat. Thyroid cancer is one of the most common forms of malignancies. It constitutes about 1% of all cancers (1). At the same time, it is the most common endocrine malignancy (1). Generally, patients do not have any complaints.

According to the National Cancer Institute, there are about 56.000 new cases of thyroid cancer each year in the US, with papillary thyroid cancer being the most common type (2). Women are more likely to have thyroid cancer with a male to female ratio of 1:3 (2).

Thyroid cancer is classified according to its clinical and histopathological behavior. One of them is well differentiated thyroid carcinoma (DTC) and the other one is poorly DTC. With a percentage of 70 to 80%, most common type of thyroid cancer is papillary thyroid cancer. Papillary thyroid cancer can occur at any age (3).

Adress for Correspondence: Mehmet Oğulcan Tezel, Trakya University School of Medicine, Edirne, TURKEY - e-mail: ogulcantezel95@gmail.com

A definitive diagnosis of thyroid cancer is made by biopsy. This is used to detect whether nodules detected by ultrasonography (USG) or routine examination are cancerous. However, less than 10% of all thyroid nodules are cancerous (4). Also, one of the most diagnostic important examinations is scintigraphy which is done to detect the function status of the nodule.

In well DTC's, F-18 FDG PET/CT is an imaging method which is used before the treatment and high risk patient groups with suspected recurrent disease. In this study, we intended to determine the character of metabolic activity of DTC and metastasis and to evaluate the findings of F-18-FDG PET/CT images in high risk patient group of DTC.

MATERIAL AND METHODS

This study is designed to retrospectively evaluate the data of the patients with high risk and determine the risk of thyroid cancer. For this object, data of 79 patients who underwent staging and restaging with FDG PET/CT imaging from 2010 to 2015 at the Trakya University Department of Nuclear Medicine were included in the study using hospital's Picture Archiving and Communication System (PACS). Age, gender, pathology examination and clinical data were noted. Metabolic activity data was evaluated. Patients with missing data were excluded.

In this study, 241 patients with the age range of 18 to 81, who were examined at Trakya University Faculty of Medicine, Department of Nuclear Medicine from 2010 to 2015, were screened.

The study group consists of 79 patients who underwent F-18 FDG PET/CT imaging for follow-up or re-staging at Trakya University Faculty of Medicine in between 2010 and 2015. The reports of the patients in the hospital archives were evaluated retrospectively. Age, gender, size of thyroid lesion, presence of lymphadenopathy, other organ metastases (lung, liver, brain, bone) were included in the study.

The assessment with 18F-FDG PET is performed as follows: Firstly, patients should fast at least for 4 hours and have a blood glucose level of <170 mg/dL at the time of 18F-FDG injection. 18F-FDG is administered through the antecubital vein. The first scan is performed as a whole-body image. The second set of images of the pancreatic area was acquired about 1 hour after the whole-body scan. Secondly, static FDG PET/CT imaging starts in 3D covering the upper torso after the injection.

Additionally, delayed PET emission images of the upper abdomen were acquired at approximately 110 minutes. Transaxial, coronal, and sagittal images for visual and semi-quantitative analysis of the data was corrected for dead time, decay and photon attenuation and reconstructed in a 128×128 matrix. Images were reconstructed using 2 iterations and 28 subsets with a 6.0 mm FWHM post filter and a fully 3D maximum likelihood ordered subset expectation maximization reconstruction algorithm. The 18F-FDG PET images were evaluated with regard to the presence and nature of focal lesions with increased 18F-FDG uptake.

As for statistical analysis, descriptive statistics as arithmetic mean± standard deviation, numbers, percentages and minimum-maximum values were used.

This study was approved by Trakya University Faculty of Medicine Scientific Research Ethics Committee.

RESULTS

Seventy nine patients were included in the retrospective study. 29 of them were male, 50 of them female. The mean age of the patients was 51 ± 15 years. The youngest patient was 18 years old; the oldest patient was 81 years old. 14 of them (18%) had no pathological metabolic foci, as so were evaluated in normal limits.

Recurrent disease was detected in the thyroid of 10 patients (13%) (Maximum Standardized Uptake Value (SUV max): 6.2±5.1; 2.3-19.3). In 54 patients (68%) lymph node metastasis was detected (SUV max: 5.8±5.1; 2.1-24.2). 12 patients had liver metastasis (SUV max: 5.7±3.9; 2.0-11.7), 12 patients had bone metastasis (SUV max: 6.1±2.9; 2.2-13.9), 8 patients had lung metastasis (SUV max: 4.3±4.5; 1.0-4.9) and one patient had brain metastasis (SUV max: 10.2). The mean values of local recurrent and metastatic foci of thyroid cancer The mean SUVmax values of local recurrent and metastatic foci of thyroid cancer were presented tabe 1. Figure 1 showed that 18F-FDG PET/CT -fusion images of a 58-year old male patient with thyroid carcinoma with lymph node, lung and brain metastases.

Table1. The mean values of local recurrent and metastatic foci of thyroid cancer.

Location lesions with increased 18F-FDG uptake	N	SUVmax value Mean± SD (range)
Thyroid- local recurrence disease	10	6.2±5.1 (2.3-19.3)
Lymph node metastasis	54	5.8±5.1 (2.1-24.2)
Bone metastasis	12	6.1±2.9 (2.2-13.9)
Lung metastasis	8	4.3±4.5 (1.0-4.9)
Liver metastasis	12	5.7±3.9 (2.0-11.7)

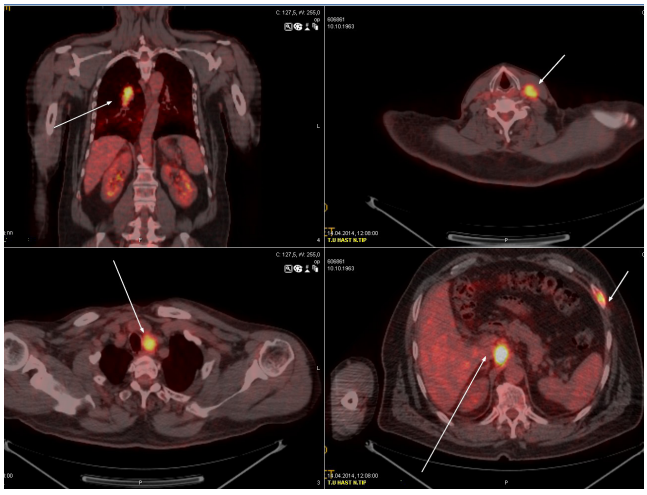

Figure 1. 18F-FDG PET/CT -fusion images of a 58-year old male patient with thyroid carcinoma with lymph node, lung and bone metastases.

DISCUSSION

In the PET imaging of high-risk differentiated thyroid cancer, we found high glucose uptake in metastatic lesions despite the iodine uptake.

We found that of the 79 patients who underwent 18F-FDG PET/CT imaging for follow-up or re-staging at Trakya University Faculty of Medicine between the years 2010-2015, 50 were male (63.3%) and 29 were female (36.7%). In a different retrospective analysis which was done in between 2009-2010, the data of 241 patients was evaluated and 222 of them (92.1%) were female and 19 (7.9%) were male (5).

According to study of Schlüter et al. (6) FDG PET has been accepted as a valuable imaging method for patients with differentiated thyroid cancer who present with elevated hTg levels and negative 131I scans. A great number of studies showed the ability of FDG PET in the detection of 131I-negative lesions seen in DTC. FDG PET/CT imaging is the only indicated in one negative case of in differentiated disease. If the FDG affinity is low in differentiated tumors, I131 imaging and Tg follow-up are preferred. In the study of Grünwald et al. (7) it was found that in most types of high-DTC's, 131I is advantageous with its high uptake values.

As a conclusion, papillary differentiated thyroid cancer is associated with a tumor showing low glucose (FDG) affinity. It is understood that the tumor changes its behavior and gets metabolically active in the patients within the high risk group and in those with systemic metastasis.

Ethics Committee Approval: This study was approved by Scientific Researches Committee of Trakya University School of Medicine.
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Brady B. Incidence and Types of Thyroid Cancer. Endocrineweb (Updated on: 06/07/17). Available from: URL: https://www.endocrineweb.com/guides/thyroid-cancer/incidence-types-thyroid-cancer.

2. Thyroid cancer-patient version. National Cancer Institute (cited 2012 Feb). Available from URL: http://www.cancer.gov/cancertopics/types/thyroid.

3. Thyroid cancer (papillary and follicular). American Thyroid Association 2016;1-4. Available from: URL: https://www.thyroid.org/wp-content/uploads/patients/brochures/ThyroidCancer_brochure.pdf?pdf=Thyroid-Cancer-Brochure.

4. Bomeli SR, LeBeau SO, Ferris RL. Evaluation of a thyroid nodule. Otolaryngol Clinics of North America 2010;43(2):229–38.

5. Bozkurt K, Bektaş S. The prevalence of thyroid cancers in surgically treated patients with nodular goiter in Şırnak city. Dicle Med J 2010;37(4):363-6.

6. Schlüter B, Bohuslavizki KH, Beyer W et al. Impact of FDG PET on patients with differentiated thyroid cancer who present with elevated thyroglobulin and negative 131I scan. The Journal of Nuclear Medicine 2001;42(1):71-6.

7. Grünwald F, Schomburg A, Bender H et al. Fluorine-18 fluorodeoxyglucose positron emission tomography in the follow-up of differentiated thyroid cancer. European Journal of Nuclear Medicine 1996;23(3):312-9.

TMSJ
Turkish Med. Stud. J. 2017; 4: 50-4 DOI: 10.4274/tmsj.2017.04.03.0004

Received: 04.08.2017 - Accepted: 21.08.2017

THE EVALUATION OF PATIENTS WITH MULTIPLE LEVEL SPINAL FRACTURES ADMITTED TO A SINGLE INSTITUTION: A RETROSPECTIVE STUDY

Nur Gülce İşkan[1], Ece Şenyiğit[1], Begüm Söyleyici[1], Mert Çiftdemir[2]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Orthopedics and Traumatology, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: The aim of this study is to evaluate the data of the patients who are diagnosed with multiple level spinal fractures and to find out the most common level of fractures. Furthermore, this data will be examined regarding patients' age, gender, fracture type, cause of the injury, and type of the treatment in order to get a baseline data to improve future outcomes.

Methods: The data of 42 patients who were diagnosed with multiple spinal fractures in Trakya University Faculty of Medicine Department of Orthopedics and Traumatology in between 2012 and 2017 was analyzed retrospectively. In order to understand the incidence of multiple spinal fractures in both genders, type of the treatment and cause of the injury, descriptive analysis as arithmetic mean ± standard deviation, number and percentages, median (mini¬-mum-maximum) were used.

Results: There were 42 patients including 32 (76.2%) men and 10 (23.8%) women with a mean age of 41 years. The most common level of injury was T12 (17.5%). The incidence of T11-L1 fractures is 62.1%. 20 (47.6%) of the fractures were caused by motor vehicle accidents. 26 patients were treated surgically and 13 patients had conservative treatment.

Conclusion: Multiple level spinal fracture is a very important clinical problem. It is seen mostly in men and middle-aged population. Thoracolumbar transition (T11-L2) is the most affected region due to the biomechanics of vertebral column. The most common causes of the multiple spinal fractures are motor vehicle accidents and falls. Management of multiple level spinal fractures are based on surgical or conservative treatment modalities. Choosing the correct treatment option for a patient with multiple level spinal fractures depends on several factors.

Keywords: Spinal fractures, retrospective study, traffic accidents

INTRODUCTION

Spinal fractures are crucial clinical problems due to the possibility of causing spinal cord injury (1). The prognosis depends on how the whole spinal cord has been affected, therefore it can vary significantly (2). Spinal fractures are more common among men between ages of 15-29 (3).

Thoracolumbar fractures which are the most commonly seen among all other spinal fractures are frequently associated with major injuries of the chest and abdomen with high-energy trauma such as motor vehicle accidents, gunshot wounds, and fall from a height (4, 5).

Studies show that vertebral fractures cause serious morbidity including depression related with chronic pain and deformity, decreased pulmonary functions, psychosocial problems related with mobility failure and decreased quality of life (6).

The most crucial approach in the treatment of spinal fractures is to limit the neurological damages and to prevent them if possible. The aim of the treatment is to maintain the stabilization of vertebral column as the other injuries of skeleton and to provide the continuity of functions. After fracture, stabilization of vertebra is provided with various treatment procedures (1, 4). In treatment, fractures are classified using several classification systems and according to the chosen classifica-

Adress for Correspondence: Nur Gülce İşkan, Trakya University Faculty of Medicine, Edirne, TURKEY - e-mail: nurgulceiskan@gmail.com

tion, conservative and surgical treatment regimens are followed. However, there is still a debate about treatment of spinal fractures due to the fact that some terms are not approved universally (3).

The aim of this study is to evaluate the data belonging to the patients who are diagnosed with multiple spinal fracture in Trakya University Faculty of Medicine Department of Orthopedics and Traumatology between 2012-2017 and to find out the most common level of fractures. Furthermore, this data will be examined regarding patients' age, gender, fracture type, cause of the injury, and type of the treatment. This analysis will provide a baseline data to improve future outcomes.

MATERIAL AND METHODS

This study was approved by Trakya University Faculty of Medicine Scientific Research Ethics Committee with the decree no. 11/14. In this study, the data of 42 patients who were diagnosed with multiple level spinal fractures between 2012 and 2017 in Trakya University Department of Orthopedics and Traumatology were analyzed retrospectively. Patients pre-diagnosed with multiple spinal fractures were selected from online database of Trakya University Hospital. Afterwards, the patients' diagnoses were confirmed using Picture Archiving and Communication Systems (PACS). In evaluating the data, injury mechanism, patients' age and gender were recorded and fractures are classified according to Magerl's classification: type A (vertebral body compression), type B (anterior and posterior element injury with distraction), and type C (anterior and posterior injury with rotation) (7).

After data collection, all of the data was analyzed by using SPSS. In order to understand the frequency of multiple level spinal fractures in both genders, injury mechanisms, and treatment options descriptive analysis as arithmetic mean ± standard deviation, number and percentages, median (minimum-maximum) were used.

RESULTS

The data of 42 patients were analyzed. 76.2% of patients were male and 23.8% were female. Among 42 patients, minimum age was 12 and maximum age was 69. The mean of ages was found as 41 years.

A total of 120 fractured vertebrae were found in cervical, thoracic and lumbar regions of 42 patients. Table 1 shows the numbers and the percentages of all fractures in each level of vertebral column. Both thoracic and lumbar fractures were observed in 18 (42.9%) patients. In 12 (28.6%) patients, only thoracic fractures were noticed and 8 (19%) patients had only lumbar fractures. C5 and C6 were the most fractured vertebral levels in cervical level. In lumbar levels, L1 was the most common fractured vertebral level with the percentage of 16.67%. 13 fractures of 120 were in L2. T12 was noticed as the most frequent one among thoracic vertebrasewith 21 fractures (17.5%). The most common fractured vertebrae are shown in Table 2. The type of the fractures can be seen in Table 3.

Table 1: All fractures in each level of vertebrae

Level	Number (n)	Percentage (%)
Cervical	5	4.17
Thoracic	32	26.67
Thoracolumbar	67	55.83
Lumbar	16	13.33

Table 2: The most common fractures in spinal column

Level	Number (n)	Percentage (%)
T12	21	17.5
L1	20	16.66
T11	13	10.83
L2	13	10.83

Table 3: The type of the fractures (Type A: vertebral body compression, type B: anterior and posterior element injury with distraction, and type C: anterior and posterior injury with rotation (7))

Type	Number (n)	Percentage (%)
A	31	73.8
A and B	3	7.1
B	4	9.5
C	4	9.5

Twenty of the fractures (47.6%) were caused by motor vehicle accidents. Falling was the second most common cause with the percentage of 38.1%. The data of 4 patients were missing.

Twenty-six patients (61.9%) underwent surgical treatment and 13 patients (31%) had conservative treatment. 1 patient was sent to epicenter because of his own request and the data of 2 patients were missing.

DISCUSSION

Multiple level spinal fractures are clinically important because of the risk of spinal or brain injury (1). They can be caused by motor vehicle accidents, fall from a height or any other accidents which happen in daily life (4, 5).

In this study, it is found that multiple level spinal fractures are more common in men than women with a percentage of 76.2%. This finding is compatible with the literature (1, 3). Since the most common causes of multiple spinal fractures in this study are motor vehicle accidents (47.6%), it is important to evaluate the gender ratio among drivers. In 2015, the percentage of male drivers in Turkey is 76.2% (8). Therefore, it could be said that because most of the drivers are male, it is expected men to be affected by multiple spinal fractures more than women.

According to the literature, spinal fractures are more common in the age of 38 than in previous years and mean is increasing year by year (3). In this study, the mean of ages was found as 41. Therefore, the results are compatible with the literature.

In this study, T11, T12, L1, and L2 are the most affected levels of the spinal column. These vertebrae constitute the thoracolumbar transition. The increased susceptibility of this region to fractures is due to the transition of the rigid thoracic spine to mobile lumbar spine (9). Neurological deficits occur more often in these situations due to biomechanical features of the spinal column (3, 9). According to the local studies, the percentage of T11-L1 fractures is 62.1% (3). It is also showed in many multi-centered studies that this region is the most commonly affected level (3). In addition, C5 and C6 were the most common fractured vertebrae. This may be due to the overexposal of C5 and C6 to functional overloading and micro traumas of daily life (10).

It is found that the most common causes of the fractures are motor vehicle accidents (74.6%) followed by falling (38.1%). According to the literature, motor vehicle accidents are also the leading cause and after the age of 45, the leading cause becomes falls (11). Motor vehicle accidents cause a high-energy trauma in the spine and falling causes a direct axial compression to the vertebral column which may lead to multiple level spinal fractures (12).

There are different methods in treatment strategies and while choosing the best treatment approach, the neurological condition of the patient, additional injuries (if any is present), the relationship of the patient with his biological and social environment before the trauma, patient's expectations, and the medical condition of the patient is important (1). The goal of the treatment is to maintain the stabilization of vertebral column with improving or maintaining its functions. (1, 4). Surgical or conservative treatment are the main approaches included in this study (Figure 1 and Figure 2). Surgical treatment is used in most of the patients because of its advantages such as providing early stability in the patients who do not tolerate the plaster or long-term bedrest. Therefore, the patients can move or sit and start the rehabilitation earlier (3).

As a conclusion, multiple level spinal fracture is a very important clinical problem. It is seen mostly in adult males. Thoracolumbar transition (T11-L2) is the most affected region due to the biomechanics of vertebral column. The most common causes of the multiple level spinal fractures are motor vehicle accidents and falls. In management of multiple spinal fractures, there are different approaches such as surgical or conservative treatments.

Ethics Committee Approval: This study was approved by Scientific Researches Committee of Trakya University School of Medicine.
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

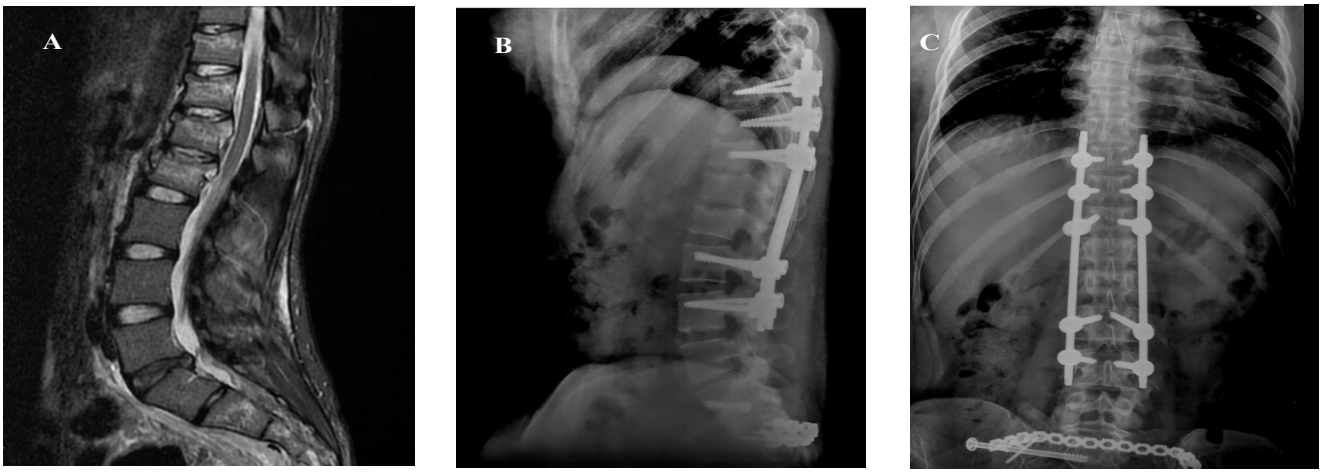

Figure 1: The pre-operative MRI (A) and post-operative radiographic images (B, C) of a patient who had type A fractures of T11-12 and L1-2.

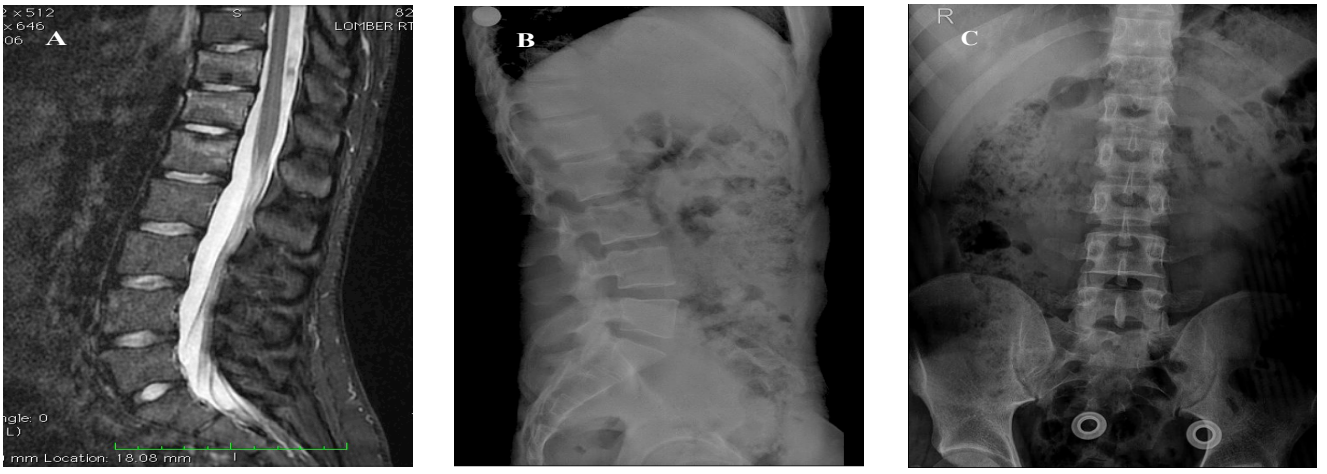

Figure 2: The MRI of a patient who had type A fractures of T11-12 and L1 (A) and radiographic images with TLSO corset (B, C).

REFERENCES

1. Tambe A, Cole A. Spinal fractures in adults. Surgery Journal 2012;30:333.

2. Krucoff M, Rahimpour S, Slutzky M et al. Enhancing nervous system recovery through neurobiologics, neural interface training, and neurorehabilitation. Front Neurosci 2016;10:584.

3. Berk H. Sırt-bel omur kırıkları. Türk Ortopedi ve Travmatolojisi Derneği Dergisi 2008;7:1-2.

4. Çiftdemir M. Thoracolumbar Fractures. Journal of Turkish Spinal Surgery 2008;19(1):55-64.

5. Kaji A, Hockberger RS. Evaluation of thoracic and lumbar spinal column injury. (cited: 2017 Oct 11) Available from: URL: https://www.uptodate.com/contents/evaluation-of-thoracic-and-lumbar-spinal-column-injury.

6. Akalın S. Minimal invasive techniques in patologic fractures: vertebroplasty and kyphoplasty. Journal of Turkish Spinal Surgery 2008;19(2):141-52.

7. Magerl F, Aebi M, Gertzbein SD et al. A comprehensive classification of thoracic and lumber injuries. Eur Spine J 1994;3:184-201.

8. Yıllara gore sürücü sayısı. (cited: 2017 Oct 15) Available from: URL: http://www.trafik.org.tr/istatistikler/yillara-gore-surucu-sayisi.

9. Gonschorek O, Hauck S, Weiß T et al. Fractures of the thoracic and lumbar spine. Chirurg 2015;86(9):901-14.

10. İşkan NG, Kurt C, Akşar A et al. The evaluation and interpretation of the most common intervertebral discs in cervical hernias: a retrospective study. Turkish Med Stud J 2016;3(1):1-3.

11. Winters BA, Nuttall C. Evaluation and management of spinal column fractures in adults. JNP 2015;11(10):1043-7.

12. Kaufman RP, Ching RP, Willis MM et al. Burst fractures of the lumbar spine in frontal crashes. Accident Analysis and Prevention 2013;59:153-63.

Turkish Med. Stud. J. 2017; 4: 55-7 DOI: 10.4274/tmsj.2017.04.03.0005
Received: 10.08.2017 - Accepted: 22.08.2017

EFFECTS OF HYPERMOBILITY ON SCHOBER TEST AND CHEST EXPANSION SCORES

Çağrı Girit[1], Semih Varnalı[1], Hilal Sena Çifcibaşı[1], Murat Birtane[2]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Physical Medicine and Rehabilitation, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: Hypermobility is a condition which increases the joint mobility range. Beighton method is used in diagnosis of hypermobility. Schober test and chest expansion measurement are frequently used to evaluate mobility of spine and expansion ability of chest in ankylosing spondylitis volunteers. In this study, it is aimed to investigate the impact of hypermobility on Schober test and chest expansion.

Methods: The data of 300 healthy volunteers aged between 18 and 32 was collected. Beighton score, chest expansion and Schober score of all volunteers were measured and statistically analyzed using SPSS. Student's t-test was performed to compare both groups. As for descriptive statistics, mean ± standard deviation and numbers were used.

Results: One hundred twenty-two cases having Beighton score of 4 and above included in hypermobility group while 178 cases under 4 served as control group without hypermobility. No significant relation in terms of chest expansion and Schober score was found out between groups. There was a slight positive correlation between Beighton score and Schober score in whole group. In male population, both test scores had a correlation with Beighton score while only chest expansion had correlation in female population.

Conclusion: Although Beighton score seemed to have no effect on Schober or chest expansion scores in between group comparisons, correlation analysis revealed that hypermobility may affect the scores, especially in males.

Keywords: Young adult, joint instability, ankylosing spondylitis

INTRODUCTION

Hypermobility is a frequently encountered condition which is characterized by hyperelasticity of soft tissues that increases the joint mobility range as a consequence. The prevalence of joint hypermobility is 20-26% in the overall population (1, 2). 6-57% of females and 2-35% of male population have hypermobility (3).

Schober test is a method to evaluate the lumbar mobility while chest expansion is a method to evaluate the thoracic wall mobility (4). Both of these measurement methods are frequently used to evaluate mobility of spine and expansion ability of chest in ankylosing spondylitis volunteers.

Ankylosing spondylitis decreases the tissue elasticity especially of the bone tissue, whereas hypermobility increases it. Therefore, it may be rational to keep in mind that standards of these tests might change due to the differences in the ability of soft tissues to expand.

The aim of this study is to determine whether there is a difference in Schober test and chest expansion scores between hypermobile and non-hypermobile healthy people.

MATERIAL AND METHODS

This study was approved by Trakya University Faculty of Medicine Scientific Researches Ethics Committee. The post hoc power of this study was calculated as 0.94 based on the lowest correlation coefficient (r=0.202) with an alpha of 5% level and n=307. 307 healthy people aged between 18 and 32 participated in

Adress for Correspondence: Çağrı Girit, Trakya University Faculty of Medicine, Edirne, TURKEY - e-mail: cagrigirit@gmail.com

this study between 24th of July and 16th of October 2017. Their data was collected in Trakya University Physical Medicine and Rehabilitation Department. Demographic data including age, BMI, sex was collected first. Then Beighton score, chest expansion and Schober scores were measured and evaluated.

Table 1: Criteria of Beighton score (5)

The ability to:	Right	Left
Dorsiflex the 5th metacarpal joint to > 90º	1	1
Oppose the thumb to the volar aspect of the ipsilateral forearm	1	1
Hyperextend the elbow to > 10º	1	1
Hyperextend the knee to > 10º	1	1
Place hands flat on the floor without bending the knees	1	
TOTAL	9	

Beighton score is a method to quantify hypermobility. Nine criteria which are shown in Table 1 are used and if the score is 4 and more out of 9, the volunteer is accepted as hypermobile (5).

Measuring the chest expansion is an anthropometric method used to evaluate chest wall mobility and if the measurement is <5 cm, it is used for the diagnosis of ankylosing spondylitis (6). The examiner measures chest expansion at the maximum inspiration and maximum expiration at the 6th rib level and notes the gap in centimeters.

Schober score is an anthropometric method used to assess ability of lumbar flexion (7). To measure Schober Test, participant stands erected and examiner determine L4-5 level of spine by drawing a horizontal line across crista iliaca. Then, examiner marks 10 cm above the midpoint. While the volunteer is in maximal lumbar flexion, examiner measures the distance between the two spots in centimeters. If the difference is less than 5 cm, it might be a sign of ankylosing spondylitis.

Student's t-test was performed to compare both groups regarding the findings obtained from the measurements. As for descriptive statistics, mean ± standard deviation numbers and percentages were used. Spearman correlation test was used to determine correlations.

RESULTS

This study was conducted among 307 participants and 7 participants dropped out due to missing data. Therefore, 300 participants were analyzed in the study. 142 (47.3%) of the participants were male and 158 (52.7%) were female. The maximum age of the participants was 32 and minimum 18. The mean age was 21.07 ± 2.53.

One hundred twenty-two cases were included in hypermobility group while 178 cases served as control group without hypermobility according to Beighton scoring. The mean age of control group was 21.09 ± 2.46 and hypermobility group was 21.03 ± 2.66. Control group and hypermobility group were not statistically different regarding BMI and age (p>0.05) (Table 2).

Table 2: Comparison of two groups in terms of demography and study parameters

	Hypermobility Group	**Control Group**	**P Value**
Age	21.03 ± 2.66	21.09 ± 2.46	P>0.05
Sex (n)	Female: 80	Female: 78	—
	Male: 42	Male: 100	
BMI	22.5079 ± 3,52	22.7142 ± 3.39	P>0.05
Schober Test	6.221 ± 2.49	5.812 ± 2.66	P>0.05
Chest Expansion	5.46 ± 1.94	5.18 ± 2.15	P>0.05

No significant relation in terms of chest expansion and Schober score was found out between groups (p>0.05) (Table 2). There was a slight positive correlation between Beighton score and Schober score in the whole group (r=0.118, p=0.04). In male population both test scores had a positive correlation with Beighton score (r=0.20, p<0.05) (r=0.23, p<0.01) while only chest expansion had correlation with Beighton score in female population (r=0.229, p<0.05) (Table 3).

Table 3: Correlation of Schober test and chest expansion scores with Beighton score

	Beighton score		
Schober score	Female:	P>0.05	r:-0.028
	Male:	P<0.01	r: 0.231
Chest expansion	Female:	P<0.05	r: 0.229
	Male:	P<0.05	r: 0.202

DISCUSSION

It is known that joint hypermobility has an important prevalence. Leslie et al. (1) reported that prevalence

of joint hypermobility as 26.2% overall and in this study, 36.7% of female volunteers and 13.7% male volunteers had joint hypermobility. In another study Oddy C et al. (2) reported that prevalence of joint hypermobility is 20%. A review by Remvig et al. (3) reported that prevalence of joint hypermobility for women was 6-57% and for men was 2-35%. In our limited study, prevalence of joint hypermobility was 40.6% overall and while 50.6% of women had joint hypermobility, only 29.5% of men did. This study revealed that hypermobility is a significantly frequent situation which affects especially female population as shown similarly in the previous studies.

Ankylosing spondylitis a disease which limits spinal and chest wall mobility and the tests which are used in the diagnosis of this disease were included. However, being hypermobile may theoretically affect the measurement outcomes so called normal. This may confound the discriminative ability between normal and pathologicalduring the interpretation of the results.

In our study, the relation of these measurement methods with hypermobility according to Beighton scores was investigated in 300 healthy volunteers. Even though there was difference in the expected direction between groups, the difference did not reach to a statistically significant value.

On the other hand, there was a slight positive correlation between Beighton score and Schober score in whole group. In male population, both test scores had a correlation with Beighton score while only chest expansion correlated with Beighton score in female population. Therefore, if more volunteers had been included in the study, the mean difference between groups might have been statistically significant.

Further studies which have different cut-off values for discriminating normal and pathologic of elasticity measures in hypermobility or non-hypermobility volunteers, are needed to completely reveal the situation.

As a conclusion, although Beighton score seemed to have no effect on Schober or chest expansion scores in between group comparisons, correlation analysis revealed that hypermobility may affect the scores, especially in males. Further studies which have different cut-off values for discriminating normal and pathologic of elasticity measures in hypermobility or non-hypermobility volunteers, are needed to completely understand the situation.

Ethics Committee Approval: This study was approved by Scientific Researches Committee of Trakya University School of Medicine.
Informed Consent: Verbal informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Leslie NR, Deanna ME. Prevalence, injury rate, and symptom frequency in generalized joint laxity and joint hypermobility syndrome in a "healthy" college population. Clinical Rheumatology 2016;35(4):1029-39.

2. Oddy C et al. The effect of generalized joint hypermobility on rate, risk and frequency of injury in male university-level rugby league players: a prospective cohort study. BMJ Open Sport & Exercise Medicine 2016;2(1): e000177.

3. Remvig L, Jensen DV, Ward RC. Epidemiology of general joint hypermobility and basis for the proposed criteria for benign joint hypermobility syndrome: review of the literature. J Rheumatol 2007;34(4):804-9.

4. Durmus B, Altay Z, Baysal O et al. Clinical use of chest expansion corrected for age and sex in volunteers with ankylosing spondylitis. Turkish Journal of Physical Medicine Rehabilitation 2011;57:128-33.

5. LaPier KT. Intertester and intratester reliability of chest excursion measurements in subjects without impairment. Cardiopulmonary Physical Therapy Journal 2000;11(3):94-8 .

6. Ferrell WR, Tennant N, Sturrock RG et al. Amelioration of symptoms by enhancement of proprioception in volunteers with joint hypermobility syndrome. Arthritis Rheum 2004;50(10):3323.

7. Yong-Ren Yen, Jin-Fan Luo, Ming-Li Liu et al. The anthropometric measurement of schober's test in normal taiwanese population. BioMed Research International 2015;256365:5.

TMSJ
Turkish Med. Stud. J. 2017; 4: 58-60 DOI: 10.4274/tmsj.2017.04.03.0006

Received: 25.08.2017 - Accepted: 06.09.2017

GAIT PATTERN OF A FEMALE PATIENT WITH FRIEBERG'S DISEASE

Seda Nalça[1], Haluk Nabi Arazlı[1], Gülnur Öztürk[2], Muhammed Parlak[3], Enis Uluçam[3]

[1] Trakya University School of Medicine, Edirne, TURKEY
[2] Department of Physical Medicine and Rehabilitation, Trakya University School of Medicine, Edirne, TURKEY
[3] Department of Anatomy, Trakya University School of Medicine, Edirne, TURKEY

ABSTRACT

Aims: Frieberg's disease is a chronic painful condition characterized by avascular necrosis of metatarsal head. With this case report, we aimed to analyze the gait pattern of a case presented with Frieberg's disease.

Case Report: A 20-year-old female patient (body weight: 50 kg, height: 1.64 m, body mass index: 18.5 kg/m^2) with a known Frieberg's disease during the last 6 years is presented. Her physical examinations showed no anatomical deformity of the foot such as hallux valgus or pes planus. The diagnosis of chronic stage Frieberg's disease was verified by a conventional posteroanterior X-ray imaging of foot. Gait analysis was performed during a painless period after physical and medical therapy. The average pressure distribution during stance phase was altered due to long-term protective behavior. There was a larger foot rotation on the affected side compared to the intacted side.

Conclusion: We considered that this gait pattern is not forced as in the primary pathologies or compensatory. Rather it may be accepted as volitional.

Keywords: Necrosis, metatarsal bone, gait

INTRODUCTION

Frieberg's disease is a chronic painful condition characterized by avascular necrosis of metatarsal head (1). It is more common among women with a male-to-female ratio of 1:5 (2). The occurrence age of previous cases ranged between 8-77 years in the literature (3). However, four out of six female patients were younger than 18 years (3). This type of avascular necrosis together with osteochondrosis mostly affects the second and third metatarsal heads in 68% and 27% of cases, respectively (4). Stanley et al. (5) reported that the longest metatarsal was affected 85% of the time. Only 6-7% of the cases suffered from bilateral involvement (4). The diagnosis and classification rely on radiographic or magnetic resonance imaging. Smillie (6) defined five stages of the disease on a radiological basis. Chronic repetitive micro-trauma is the most commonly accepted pathophysiological mechanism and, other suggested theories include single trauma leading to metacarpophalangeal (MTP) joint impingement, epiphyseal ischemia caused by arterial spasm, and combination of multiple factors (1, 5, 7, 8). As the disease affects metatarsals and leads to a painful condition, we hypothesized that it may alter gait pattern. In this case report, we present gait analysis results of a female patient with a known Frieberg's disease during the last 6 years. To the author's knowledge, no previous report investigated the gait characteristics of any patient with this condition.

CASE REPORT

A 20-year old woman (body weight: 50 kg, height: 1.64 m, body mass index: 18.5 kg/m^2) with a history of Frieberg's disease was referred to gait analysis laboratory of Anatomy department by her physiotherapist. She complained of a right foot pain one month ago. The pain was at moderate level and increased during walking. There was no history of apparent trauma but the patient reported repetitive small traumas due to foot stepping while studying at desk. Her medical history revealed that she was diagnosed with unilateral Frieberg's disease six years ago. The possible cause was a single major trauma during a football match at that time. Her orthopedist recommended a metatarsal pro-

Adress for Correspondence: Gülnur Öztürk, Physical medicine and Rehabilitation, Trakya University Faculty of Medicine, Edirne, TURKEY - e-mail: gguullozturk@hotmail.com

tector pad as the initial treatment. The patient used this pad at times of painful periods to relieve the pain. She also avoided from exercise activities that would bear weight onto her injured foot. The second admission to hospital was one month ago, 6 years after the initial diagnosis. Physical examination showed no anatomical deformity of the foot such as hallux valgus or pes planus. The diagnosis of chronic stage Frieberg's disease was verified by a conventional posteroanterior X-ray imaging of foot which revealed chronic stage avascular necrosis of the second metatarsal characterized by collapse of metatarsal head and fragmentation of the bone (Figure 1). After obtaining written informed consent from the patient, two gait analyses by 2-month intervals were planned and performed during painless period after physical and medical therapy.

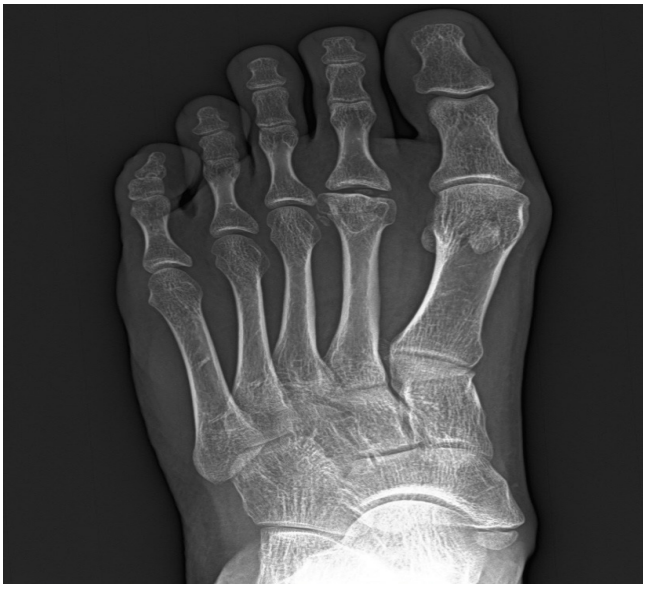

Figure 1: Right foot. Anterior-posterior radiograph demonstrating avascular necrosis of the head of the second metatarsal.

Gait analysis was performed by a computerized force distribution measurement system (FDM-System Gait Analysis, Zebris Medical GmbH, Germany). Results are given in Table 1. Stance and swing phases of walking were evaluated within normal limits. The only significant alteration was foot rotation in the affected side. Both tests showed that the patient rotated her right foot during walking in order to protect the affected metatarsal. This strange antalgic stepping led to an altered average force and pressure characteristics in the chronicle period (Figure 2). Other parameters were comparable between the two sides.

Table 1: Gait characteristics of a 20-year-old female patient with Frieberg's disease.

Parameters	Test 1	Test 2	Mean Value*
Foot rotation L/R, deg	2.7±2.2 / 4.7±1.6	2.6±1.9 / 4.3±1.5	2.6±2.0 / 4.5±1.5
Step length L/R, cm	54±5 / 58±1	55±1 / 53±3	54±3 / 55±2
Step time L/R, sec	0.56±0.02 / 0.56±0.02	0.58±0.02 / 0.59±0.02	0.57±0.02/0.57±0.02
Stance phase L/R, %	62.4±1.0 / 63.5±1.6	65.2±1.2 / 65.3±1.1	63.8±1.1 / 64.4±1.3
Swing phase L/R, %	37.6±1.0 / 36.5±1.6	34.8±1.2 / 34.7±1.1	36.2±1.1 / 35.6±1.1
Stride length, cm	113±5	108±3	110±4
Stride time, sec	1.13±0.04	1.17±0.03	1.15±0.03
Cadence, stride/min	53±2	51±1	52±1
Velocity, km/h	3.60±0.29	3.32±0.25	3.46±0.27
Variability of velocity, %	8	8	8

Abbreviations: L/R, Left/Right;

****The mean of the first and second tests.***

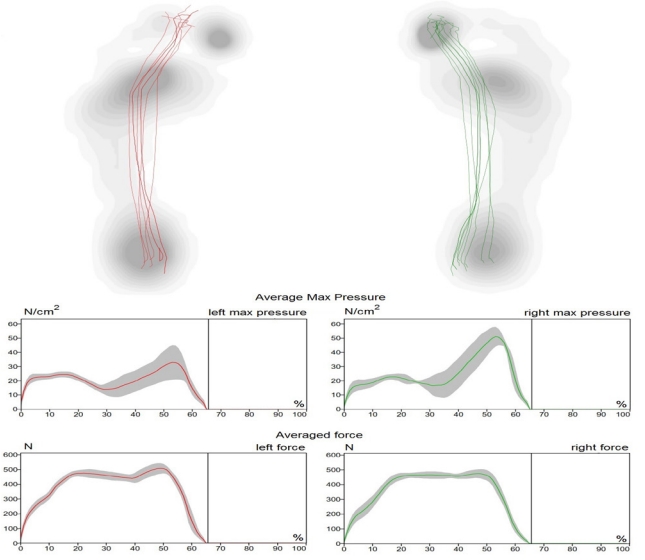

Figure 2: Average maximum pressure graphics of left (upper) and right (lower) foot.

DISCUSSION

We studied gait characteristics of a female patient with a known diagnosis of Frieberg's disease for the last six years. No previous reports described walking pattern in this condition. Pressure pattern was changed in the affected side. Although there was no apparent or observable antalgic limp, the average pressure distribution during stance phase was altered due to long-term protective behavior. There was a larger foot rotation on the affected side compared to intact side. This type of

rotation shifts the pressure arc slightly to medial direction. Thus, the second metatarsal is saved from pressure during stance phase of gait (Figure 2). Step time and step length were similar in both sides. Stance phase and swing phase occupy 60% and 40% on average, respectively. There were no significant alterations of stance and swing phases of gait. Well-known determinants of gait are pelvic rotation and obliquity, knee flexion in stance phase, ankle mechanism, foot mechanism, and lateral displacement of body (9). In this case, the affected determinants of gait seem to be the ankle and foot mechanisms. From the initial contact of heel to the ground to the toe off, pressure sites of plantar surface changed and spared the affected second metatarsal from weight-bearing position. We considered that this gait pattern is not forced as in the primary pathologies or compensatory. Rather it may be accepted as volitional. Furthermore, gait analysis may reveal such subtle changes in gait pattern and may help to plan an effective treatment.

Ethics Committee Approval: N/A
Informed Consent: Written informed consent was obtained from the participants of this study.
Conflict of Interest: The authors declared no conflict of interest.
Financial disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Carmont MR, Rees RJ, Blundell CM. Current concepts review; Freiberg's disease. Foot Ankle Int 2009;30(2):167-76.

2. Katcherian DA. Treatment of Freiberg's disease. Orthop Clin North Am 1994;25(1):69-81.

3. Fehr SD, Walter KD. Freiberg disease: background, epidemiology, etiology. Medscape Reference. Available from: URL:http://emedicine.medscape.com/article/1236085-overview (27 June 2016).

4. Gauthier G, Elbaz R. Freiberg's infraction: a subchondral bone fatigue fracture. A new surgical treatment. Clin Orthop Relat Res 1979;142:93-5.

5. Stanley D, Betts RP, Rowley DI et al. Assessment of etiologic factors in the development of Freiberg's disease. J Foot Surg 1990;29:444-7.

6. Smillie IS. Treatment of Freiberg's infraction. Proc R Soc Med 1967;60(1):29–31.

7. McMaster MJ. The pathogenesis of hallux rigidus. J Bone Joint Surg 1978;60(1):82-7.

8. Viladot A, Viladot A. Osteochondroses: aseptic necrosis of the foot. In: Melvin H, Jahss MD, editors. Disorders of the Foot and Ankle. 2nd ed. Philadelphia: Saunders; 1991.p.617-38.

9. Michael W. An introduction to gait analysis. 4th ed. Philadelphia: Butterworth Heinemann Elsevier; 2007.p.88-92.

4rd Volume Index
SUBJECT INDEX
February 2017 – October 2017

4rd Volume Index
AUTHOR INDEX
February 2017 – October 2017

Authorship Contributions Form

Manuscript No. :

……

……

Manuscript Title :

……

……

Corresponding author :

……

1. Authorship requires at least 3 contributions listed in the table below, including critical review of the manuscript, which is a mandatory contribution for all authors.
2. All authors are required to contribute to manuscript draft preparation, and critical review of its important intellectual content.
3. All authors are responsible for approval of the final proofs of the article
4. Those authors who do not fulfill the required number of contributions or do not meet criteria should be listed in the Acknowledgement section at the end of the manuscript.
5. These rules are set in frame of Council of Science Editors (CSE) and International Committee of Medical Journal Editors (ICMJE) guidelines for authorship.

Contribution	Explanation	Contributing Authors
CONCEPT	The idea for research or article/hypothesis generation	
DESIGN	Planning the methods to generate hypothesis	
SUPERVISION	Supervision and responsibility for the organization and course of the project and the manuscript preparation	
RESOURCES	Supplying financial resources, equipment, space, and personnel vital to the project	
MATERIALS	Biological materials, reagents, referred patients	
DATA COLLECTION AND/OR PROCESSING	Responsibility for conducting experiments, management of patients, organizing and reporting data	
ANALYSIS AND/OR INTERPRETATION	Responsibility for presentation and logical explanation of results	
LITERATURE SEARCH	Responsibility for conducting literature search	
WRITING MANUSCRIPT	Responsibility for creation of an entire or the substantial part of the manuscript	
CRITICAL REVIEW	Reworking the final, before submission version of the manuscript for intellectual content, not just spelling and grammar check	
OTHER	For novel contributions:	

CORRESPONDING AUTHOR :

……

SIGNATURE : …… DATE : ……

TMSJ Form for Disclosure of Potential Conflicts of Interest

The purpose of this form is to provide readers of your manuscript with information about your other interests that could influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information.
* The form is in four parts.

1. Identifying information.
Type your full name. If you are NOT the corresponding author please check the box "No" and type the name of the corresponding author. Provide the requested manuscript information.
*If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare under Sections 2, 3, or 4 below, you can check "Nothing to disclose" (see Section 1, line 7, page 2). In this case only, the disclosure applies to all authors, and the form is complete.

2. The work under consideration for publication.
This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party—that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation, or commercial sponsor, check "Yes". Then complete the appropriate boxes to indicate the type of support and whether the payment went to you, or to your institution, or both.

3. Relevant financial activities outside the submitted work.
This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work.
Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.
For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations, or academic institutions, need not be disclosed here (but can be acknowledged on the title page of the manuscript). For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

4. Other relationships.
Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.
*If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare under Sections 2, 3, or 4 below, you can check "Nothing to disclose" (see Section 1, line 7, page 2). In this case only, the disclosure applies to all authors, and the form is complete.

Section 1. Identifying Information
Complete by providing the requested information in the white boxes.

1. Given Name (First Name):		2. Surname Last Name):		3. Current Date:	
4. Are you the corresponding author?	___Yes	___No	If "No", name of corresponding author:		
5. Manuscript Title:					
6. Manuscript Identifying Number (if you know it):					
7. If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare, check here:				___**Nothing to Disclose**	

TMSJ Form for Disclosure of Potential Conflicts of Interest

The purpose of this form is to provide readers of your manuscript with information about your other interests that could influence how they receive and understand your work. The form is designed to be completed electronically and stored electronically. Each author should submit a separate form and is responsible for the accuracy and completeness of the submitted information.
* The form is in four parts.

1. Identifying information.
Type your full name. If you are NOT the corresponding author please check the box "No" and type the name of the corresponding author. Provide the requested manuscript information.
*If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare under Sections 2, 3, or 4 below, you can check "Nothing to disclose" (see Section 1, line 7, page 2). In this case only, the disclosure applies to all authors, and the form is complete.

2. The work under consideration for publication.
This section asks for information about the work that you have submitted for publication. The time frame for this reporting is that of the work itself, from the initial conception and planning to the present. The requested information is about resources that you received, either directly or indirectly (via your institution), to enable you to complete the work. Checking "No" means that you did the work without receiving any financial support from any third party—that is, the work was supported by funds from the same institution that pays your salary and that institution did not receive third-party funds with which to pay you. If you or your institution received funds from a third party to support the work, such as a government granting agency, charitable foundation, or commercial sponsor, check "Yes". Then complete the appropriate boxes to indicate the type of support and whether the payment went to you, or to your institution, or both.

3. Relevant financial activities outside the submitted work.
This section asks about your financial relationships with entities in the bio-medical arena that could be perceived to influence, or that give the appearance of potentially influencing, what you wrote in the submitted work. You should disclose interactions with ANY entity that could be considered broadly relevant to the work.
Report all sources of revenue paid (or promised to be paid) directly to you or your institution on your behalf over the 36 months prior to submission of the work. This should include all monies from sources with relevance to the submitted work, not just monies from the entity that sponsored the research. Please note that your interactions with the work's sponsor that are outside the submitted work should also be listed here. If there is any question, it is usually better to disclose a relationship than not to do so.
For grants you have received for work outside the submitted work, you should disclose support ONLY from entities that could be perceived to be affected financially by the published work, such as drug companies, or foundations supported by entities that could be perceived to have a financial stake in the outcome. Public funding sources, such as government agencies, charitable foundations, or academic institutions, need not be disclosed here (but can be acknowledged on the title page of the manuscript). For example, if a government agency sponsored a study in which you have been involved and drugs were provided by a pharmaceutical company, you need only list the pharmaceutical company.

4. Other relationships.
Use this section to report other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work.
*If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare under Sections 2, 3, or 4 below, you can check "Nothing to disclose" (see Section 1, line 7, page 2). In this case only, the disclosure applies to all authors, and the form is complete.

Section 1. Identifying Information
Complete by providing the requested information in the white boxes.

1. Given Name (First Name):		2. Surname Last Name):		3. Current Date:	
4. Are you the corresponding author?	___Yes	___No	If "No", name of corresponding author:		
5. Manuscript Title:					
6. Manuscript Identifying Number (if you know it):					
7. If you are the corresponding author, and neither you nor your co-authors have any disclosures to declare, check here:				___**Nothing to Disclose**	

Section 2. The Work Under Consideration for Publication

Did you or your institution at any time receive payment or services from a third party for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc...)?

Complete each row by checking "No" or providing the requested information in the white boxes. Add rows as needed.

The Work Under Consideration for Publication

Type	No	Money Paid to You	Money to Your Institution*	Name of Entity	Comments
1. Grant					
2. Consulting fee or honorarium					
3. Support for travel to meetings for the study or other purposes					
4. Fees for participation in review activities such as data monitoring boards, statistical analysis, end point committees, and the like					
5. Payment for writing or reviewing the manuscript					
6. Provisions of writing assistance, medicines, equipment, or administrative support					
7. Other					

*This means money that your institution received for your efforts this study.

Section 3. Relevant financial activities outside the submitted work.

Please indicate whether you have financial relationships (regardless of amount of compensation) with entities as described in the instructions. You should report relationships that were present during the 36 months prior to submission.

Complete each row by checking "No" or providing the requested information in the white boxes.

Relevant Financial Activities Outside the Submitted Work

Type of Relationship (in alphabetical order)	No	Money Paid to You	Money to Your Institution*	Name of Entity	Comments
1. Board membership					
2. Consultancy					
3. Employment					
4. Expert testimony					
5. Grants/grants pending					
6. Payment for lectures including service on speakers bureaus					
7. Payment for manuscript preparation					
8. Patents (planned, pending or issued)					
9. Royalties					
10. Payment for development of educational presentations					
11. Stock/stock options					
12. Travel/accommodations/ meeting expenses unrelated to activities listed**					
13. Other (err on the side of full disclosure)					

*This means money that your institution received for your efforts.

**For example, if you report a consultancy above there is no need to report travel related to that consultancy on this line.

Section 4. Other Relationships

Are there other relationships or activities that readers could perceive to have influenced, or that give the appearance of potentially influencing, what you wrote in the submitted work?

____No other relationships/conditions/circumstances that present a potential conflict of interest.

____Yes, the following relationships/conditions/circumstances are present (explain below):

At the time of manuscript acceptance, we ask that you update your disclosure statements if anything has changed. On occasion, we may ask you to disclose further information about reported relationships.

This form is adapted from the Author Disclosure Form created by the International Committee of Medical Journal Editors (ICMJE). The ICMJE has not endorsed nor approved the contents here. The official version of the ICMJE Author Disclosure Form is located at http://www.icmje.org/coi_disclosure.pdf

CONSENT FORM for CASE REPORT

Title of Project:_____

1. I have read, and understood the Participant Information Sheet dated _____
2. I freely agree to the use of my medical records for the purpose of this study.
3. I understand that the case report will be published without my name attached and researchers will make every attempt to ensure my anonymity. I understand, however, that complete anonymity cannot be guaranteed.
4. I have been given a copy of the Participant Information Sheet and Consent Form to keep.

Name of Participant_____

Signature of Participant _____ Date _____

The participant was informed through phone call and a verbal consent was obtained.

The following section regarding the witness is not essential but may be appropriate for patients where the research teams feel that the participant should have a witness to the consent procedure.

Name of witness (if appropriate)_____

Signature of witness_____ Date _____

Name of Researcher_____

Signature of Researcher_____ Date_____

Name of Researcher

Signature of Researcher_____ Date_____